



WASTE MANAGEMENT PROGRESS REPORT

Foreword



Department of Energy
Washington, D.C. 20585
November 1999

For the last three years I have been reporting to you on the progress the Waste Management Program has made in carrying out its mission to manage and safely dispose of the Department's radioactive waste. Our semi-annual *Waste Management Progress Report* has highlighted the achievements of the program and identified the challenges we have met in working toward our goals. As I issue this report, looking back on the progress and accomplishments of fiscal year 1999, I am also looking forward to a new organization that will continue the work that the Office of Waste Management has begun. In July 1999, Dr. Carolyn Huntoon was sworn in as the new Assistant Secretary for Environmental Management. Effective in late November 1999, Dr. Huntoon will have a restructured Office of Environmental Management in place that aligns the headquarters organization with our cleanup goals to accelerate site closures and project completions. Because this will be the last progress report under the existing Office of Waste Management, we have expanded the scope to include a brief look at program accomplishments over the last ten years, while maintaining a focus on fiscal year 1999.

Fiscal year 1999 has been a year of great accomplishments as well as demanding challenges for the Waste Management Program. In the forefront was the opening of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Disposal operations began in March of this year and by the end of the year WIPP had safely received 32 shipments of transuranic waste from three DOE sites. Regrettably, burdensome restrictions imposed by the RCRA Part B permit will force DOE to suspend shipments temporarily when the permit becomes effective (starting November 26); however, we are taking the requisite steps that will allow us to resume shipments to WIPP early next year, keeping us on track to meet program milestones and stakeholder commitments.

Vitrification operations at Savannah River and West Valley continue to be successful in meeting their performance goals for producing disposal-ready canisters of immobilized high-level waste. At the same time, we are challenged with the task of selecting an alternative technology for salt processing at the Defense Waste Processing Facility. This selection is expected to be made only after sufficient research and development is completed to assure success.

Extensive stakeholder participation in a series of workshops and meetings has been valuable in helping to bring us closer to a final decision on the configuration for the treatment and disposal of mixed low-level and low-level waste. We expect to notify the public of the selection of preferred disposal sites and issue the mixed low-level and low-level waste Record of Decision in the very near future.

The following report details these and many other accomplishments that have resulted from the hard work of many talented individuals at headquarters and the field. As we close out the year and move on to new assignments, I wish to thank everyone associated with the progress that has been made in the Waste Management Program over the past ten years for their dedication and support.

A handwritten signature in black ink that reads "Mark W. Frei".

Mark W. Frei
Acting Deputy Assistant Secretary for Waste Management

Waste Management Performance Commitments

Waste Management measures volumes of waste stored, treated, and disposed as indicators of progress toward meeting the program's goals and specific objectives. Actual performance is measured and compared against established annual commitments. The year-end status of key fiscal year (FY) 1999 performance measures as of September 30, 1999, is presented in the following tables. Note that data presented include only EM funded activities.

| High-Level Waste Canisters Produced FY 1999 Performance | | |
|--|------------|------------|
| | Plan | Actual |
| Defense Waste Processing Facility | 200 | 236 |
| West Valley Demonstration Project | 15 | 12 |
| Total | 215 | 248 |

| Mixed Low-Level Waste FY 1999 Performance | | | | |
|--|---------------|---------------|---------------|---------------|
| | Treated | | Disposed | |
| | Plan | Actual | Plan | Actual |
| Albuquerque | 0 | 0 | 79 | 144 |
| Chicago | 31 | 11 | 11 | 6 |
| Idaho | 113 | 222 | 50 | 75 |
| Nevada | 0 | 13 | 0 | 2 |
| Oak Ridge | 4,139 | 2,472 | 11,830 | 8,033 |
| Oakland | 150 | 445 | 203 | 327 |
| Ohio | 9 | 12 | 532 | 19 |
| Richland | 608 | 16 | 0 | 182 |
| Rocky Flats | 4,886 | 5,537 | 2,886 | 5,537 |
| Savannah River | 1,073 | 1,324 | 0 | 0 |
| Total | 11,009 | 10,052 | 15,591 | 14,325 |

(Volume in cubic meters)

| Transuranic Waste FY 1999 Performance | | | |
|--|-------------------------|------------|-----------------|
| | Made Ready For Disposal | | Shipped to WIPP |
| | Plan | Actual | Actual |
| Albuquerque | 0 | 191 | 191 |
| Chicago | 2 | 0 | 0 |
| Idaho | 10 | 26 | 26 ¹ |
| Richland | 22 | 24 | 0 |
| Rocky Flats | 670 | 129 | 65 |
| Savannah River | 44 | 0 | 0 |
| Total | 748 | 370 | 282 |
| Disposed at WIPP | | | |
| | Plan | Actual | |
| Carlsbad | 100-200 | 276 | |

(Volume in cubic meters)

| Low-Level Waste FY 1999 Performance | | | | |
|--|---------------|---------------|------------------------------|---------------|
| | Disposed | | Shipped to DOE Disposal Site | |
| | Plan | Actual | Plan | Actual |
| Albuquerque | 0 | 0 | 0 | 0 |
| Chicago | 174 | 220 | 574 | 220 |
| Idaho | 6,500 | 4,671 | 0 | 0 |
| Nevada | 37,742 | 17,125 | 0 | 0 |
| Oak Ridge | 1,946 | 1,421 | 2,949 | 0 |
| Oakland | 1,446 | 2,324 | 1,863 | 2,144 |
| Ohio | 10,016 | 8,810 | 8,895 | 7,681 |
| Richland | 6,120 | 6,080 | 0 | 0 |
| Rocky Flats | 0 | 0 | 2,630 | 5,686 |
| Savannah River | 9,576 | 8,792 | 0 | 0 |
| Total | 73,520 | 49,443 | 16,911 | 15,731 |

(Volume in cubic meters)

¹Includes a fourth shipment containing 6 cubic meters that departed Idaho on 9-30-99 and arrived at WIPP on 10-02-99.

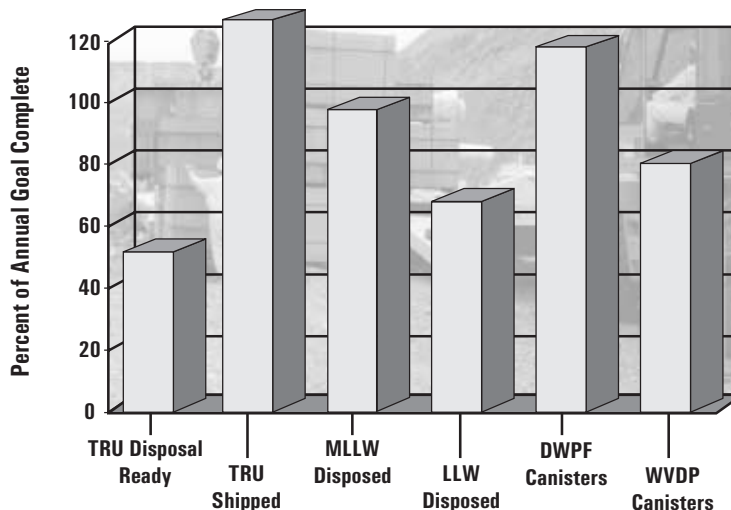
Waste Management FY 1999 Progress Report

FY 1999 Secretary's Agreement with the President

In FY 1999, the Secretary of Energy's Performance Agreement with the President included six performance targets for the Waste Management Program that support the Departmental Environmental Quality objective to safely and expeditiously dispose of waste generated by defense nuclear materials production and civilian nuclear research and development programs, and make high-level radioactive waste disposal ready. The FY 1999 waste management performance targets and year-end status of each target are:

- ◆ Make disposal ready 700 cubic meters of transuranic (TRU) waste.
As of September 30, 1999, 370 cubic meters of TRU waste were made disposal ready, 276 of which were received at WIPP. The delayed opening of WIPP postponed the preparation of additional waste for disposal.
- ◆ Ship 100 to 200 cubic meters of TRU waste to the Waste Isolation Pilot Plant (WIPP) for disposal.
282 cubic meters of TRU waste were shipped to WIPP for disposal. 276 cubic meters were received at WIPP as of September 30, 1999. 6 cubic meters were en route from Idaho.
- ◆ Dispose of 15,000 cubic meters of mixed low-level waste (MLLW).
14,325 cubic meters of MLLW were disposed.
- ◆ Dispose of 73,000 cubic meters of low-level waste (LLW).
49,443 cubic meters of LLW were disposed. The Nevada Test Site did not generate a large volume of restoration waste for disposal as planned due to lack of agreement with the State of Nevada on cleanup standards. Also, shipments from Oak Ridge to an offsite DOE disposal facility did not occur as planned due to lack of NEPA authority.
- ◆ Produce 200 canisters of HLW at the Defense Waste Processing Facility (DWPF) at the Savannah River Site.
Savannah River produced 236 canisters.
- ◆ Produce 15 canisters of HLW at the West Valley Demonstration Project (WVDP).
West Valley produced 12 canisters; fewer canisters were produced than planned due to an outage in the vitrification facility from early August through late September.

Waste Management Commitments FY 1999 Year-End Status



High-level waste (HLW) is the highly radioactive waste material resulting primarily from the reprocessing of spent nuclear fuel at U.S. Department of Energy (DOE) sites. The waste is stored mainly as liquids, sludges, or salts, with some waste in the form of a solid calcine. Removing stored HLW from underground tanks and immobilizing it reduces the potential for future environmental contamination.

Hanford Meets Consent Decree Milestones

Early in FY 1999, in response to congressional direction, DOE established the Office of River Protection (ORP) at the Hanford site in Washington State to manage all aspects of the Tank Waste Remediation System (TWRS). The mission of the ORP is to store, treat, immobilize, and dispose of the Hanford site tank waste in an environmentally sound, safe, and cost-effective manner.

Washington State and DOE signed an Interim Stabilization Consent Decree, approved by the court in September 1999, that establishes court-enforceable, technically sound schedules for pumping liquid nuclear waste out of the remaining 29 unstabilized, single-shell tanks. The purpose of interim stabilization is to remove the remaining pumpable liquids in single-shell tanks to reduce the risk of leaks. During interim stabilization, single-shell tank liquids are pumped and transferred to double-shell tanks, which have no history of leakage. Key elements of the consent decree include pumping the tanks that pose the greatest environmental risk first, thus providing additional protection for the Columbia River and public health; accelerating the schedule for pumping so that 100 percent of the remaining pumpable liquid is removed by September 2004; and increasing DOE funding to a level that will support successful execution of the new schedule for tank stabilization.

In FY 1999, the Hanford site initiated interim stabilization of four single-shell tanks (S-102, S-103, S-106, SX-106) and continued pumping from three other tanks (SX-104, T-104, and T-110). By the end of the fiscal year,

the Interim Stabilization Project pumped 456,710 gallons from these seven tanks, exceeding the Consent Decree volume requirement of 432,000 gallons by 24,710 gallons.

Sluicing and pumping sludge from Tank C-106 was completed in July 1999. Successful completion of this milestone resolves a serious safety concern at Hanford. Tank C-106 was the highest heat-generating single-shell underground radioactive waste storage tank at Hanford, which required the addition of cooling water to remove the heat generated and prevent self-boiling. Approximately 68 inches of sludge (from a total of 69 inches) has been transferred from Tank C-106 to double-shell Tank AY-102 since the first sluicing campaign. Periodic water additions to Tank C-106 are no longer required to promote evaporative cooling, which resolves the high-heat safety issue associated with this tank.

HLW Processing at Savannah River

DWPF continues to process tank waste at the Savannah River Site (SRS) into disposal-ready canisters of vitrified HLW. In FY 1999, DWPF produced 236 canisters. This brings the total inventory of canisters produced at Savannah River to 719 canisters, or over 14 percent of the life cycle projection of about 5,000 canisters.



A pump is installed in single-shell Tank SX-106 at Hanford to remove liquid radioactive wastes.

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Interior of the Defense Waste Processing Facility at Savannah River Site.

In FY 1999, the Savannah River Operations Office began work on a supplemental environmental impact statement (SEIS) on the proposed replacement technology for HLW salt processing by in-tank precipitation at DWPF. The SEIS will evaluate the potential environmental impacts of four proposed technologies and a no action alternative. Public scoping meetings were held in March 1999. A draft SEIS is expected to be issued by the end of calendar year 1999.

Parallel with development of the SEIS, Savannah River conducted detailed technical evaluations of two of the four technologies and obtained an independent, external review by the National Research Council of the National Academy of Sciences. The National Research Council's interim report on their evaluation was issued in October 1999. All of these efforts will

support identification of a preferred alternative in the final SEIS, which is planned for later in FY 2000.

Continued Progress at West Valley

In FY 1999, the West Valley Demonstration Project (WVDP) in New York continued to process HLW tank heels, producing 12 canisters of vitrified HLW. With 241 canisters in inventory, the vitrification phase of the WVDP is nearing completion. West Valley plans to continue vitrification operations through FY 2001, producing only about 10 more canisters from the remaining tank heels. In addition, West Valley exceeded one of their two curie transfer goals for the year, transferring approximately 450,000 curies from Tank 8D-1 to 8D-2, against a goal of 400,000. Material containing 367,000 curies was transferred from Tank 8D-2 to the vitrification facility, falling short of the goal of 500,000 curies. This goal was missed primarily because of an off-normal occurrence in the vitrification facility in August. Curie transfers have since resumed.

In May 1999, the Department initiated a series of meetings with the New York State Energy Research and Development Authority to discuss roles and responsibilities for future clean-up work at the site. Negotiations will continue into FY 2000 to develop a preferred alternative for the West Valley project completion environmental impact statement.

HLW Storage Record of Decision

In August 1999, the Department issued its *Record of Decision on the Storage of High-Level Radioactive Waste*. The Department has selected a decentralized alternative, to store immobilized HLW in a final form at the site of generation – Hanford, Idaho National Engineering and Environmental Laboratory (INEEL), SRS, or WVDP – until transfer to a geologic repository. This decision allows use of existing immobilized HLW storage capacity at SRS and WVDP and use of the almost complete Canister Storage Building at Hanford, which will provide partial storage for its HLW. This approach also reduces environmental impacts that would result from constructing larger storage facilities.



During his May 4, 1999 visit to the West Valley Demonstration Project, Energy Secretary Bill Richardson operates the mechanical arm that is being used to clean the bottom of the high-level waste tank.

TRANSURANIC WASTE PROGRAM

Transuranic (TRU) waste is radioactive waste contaminated with isotopes that are heavier than uranium, have half-lives greater than 20 years, and are generated primarily during research and development, plutonium recovery, weapons manufacturing, and decontamination and decommissioning. TRU waste consists of clothing, tools, rags, debris, residues, and other disposable items contaminated with radioactive elements.

Waste Isolation Pilot Plant Opens

On March 26, 1999, the WIPP facility, near Carlsbad, New Mexico, received its first shipment of TRU waste for disposal. This historic first shipment marked the culmination of more than 25 years of effort by the DOE to open the nation's first licensed nuclear waste repository, and the start of a new phase in its ongoing commitment to safely clean up the nation's Cold War legacy nuclear waste.



Standard Waste Boxes holding transuranic waste are safely disposed underground at the Waste Isolation Pilot Plant.

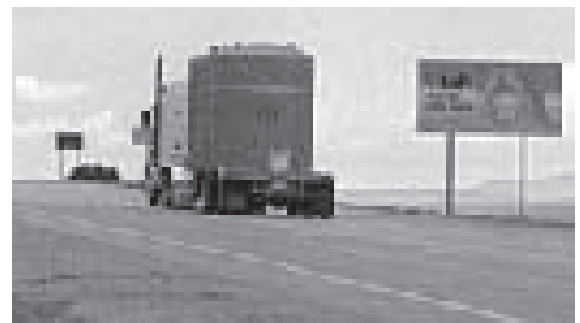
WIPP is a cornerstone of DOE's cleanup efforts. The start of disposal operations at WIPP brings the Department one step closer to meeting major program milestones throughout the complex. Based on planned shipment schedules that currently are being refined, continued shipments of TRU waste to WIPP over the next several years will mean that the Department will be able to meet its commitments with several states, including the Idaho Settlement Agreement deadlines, the Oak Ridge Federal Facility Compliance Act Consent Order milestone, and the accelerated closure commitment at the Rocky Flats Environmental Technology Site in Colorado.

The WIPP facility has a disposal capacity of 6.2 million cubic feet (175,600 cubic meters) of transuranic waste. It will take approximately 35 years and over 30,000 waste shipments to dispose of currently stored and newly generated TRU waste from 10 major DOE sites and 13 small quantity sites across the country.

WIPP Reaches First Year Disposal Goals

During its first six months of operation, WIPP received 32 shipments containing about 276 cubic meters of nonmixed TRU waste. Seventeen shipments were completed from Los Alamos National Laboratory for a total of 191 cubic meters. On April 27, 1999, INEEL made its first shipment to WIPP, meeting a Settlement Agreement requirement to begin shipping TRU waste out of the state by April 30, 1999. A total of 3 shipments received from Idaho during FY 1999 consisted of 20 cubic meters. Rocky Flats Environmental Technology Site in Colorado shipped 65 cubic meters to WIPP in 12 shipments.

In FY 2000, WIPP will continue to receive shipments from these three sites, with emphasis on shipments from Rocky Flats and Idaho. Rocky Flats has a projected total inventory of approximately 15,000 cubic meters of TRU waste to be shipped in the next seven years to meet its 2006 accelerated closure schedule. Shipments from Idaho will make progress toward their next Settlement Agreement milestone to remove at least 3,100 cubic meters from the state by December 31, 2002. Idaho's entire inventory of 65,000 cubic meters must be shipped by a target date of December 31, 2015 but no later than December 31, 2018. Initial shipments from Hanford are scheduled to start in February 2000 and from SRS later in FY 2000.



The first transuranic waste shipment leaves the State of Idaho on April 27, 1999.

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TRUPACT Procurement

DOE currently has 15 TRUPACT-II shipping containers which are used to transport 55-gallon drums and standard waste boxes containing contact-handled TRU waste to WIPP. To support the expected level of shipments in the next several years, the Albuquerque Operations Office has awarded two five-year fixed-unit price contracts for a total of 12 TRUPACT-II shipping containers with contract options under privatization for additional TRUPACT-IIs and HalfPACTs. Westinghouse Engineered Products Department of Carlsbad, New Mexico, and NAC International of Norcross, Georgia were selected to fabricate the contact-handled TRU waste shipping containers. The first unit will be delivered in May 2000, and the twelfth will be delivered in February 2001.

In support of the program to transport remote-handled TRU waste to WIPP, the Carlsbad Area Office anticipates issuing a Request for Proposal (RFP) in FY 2000 for the construction of the RH-72B shipping casks for transporting containers of remote-handled TRU waste to WIPP.

An RFP for the combined contact-handled and remote-handled transportation services contract also is expected to be released in FY 2000.



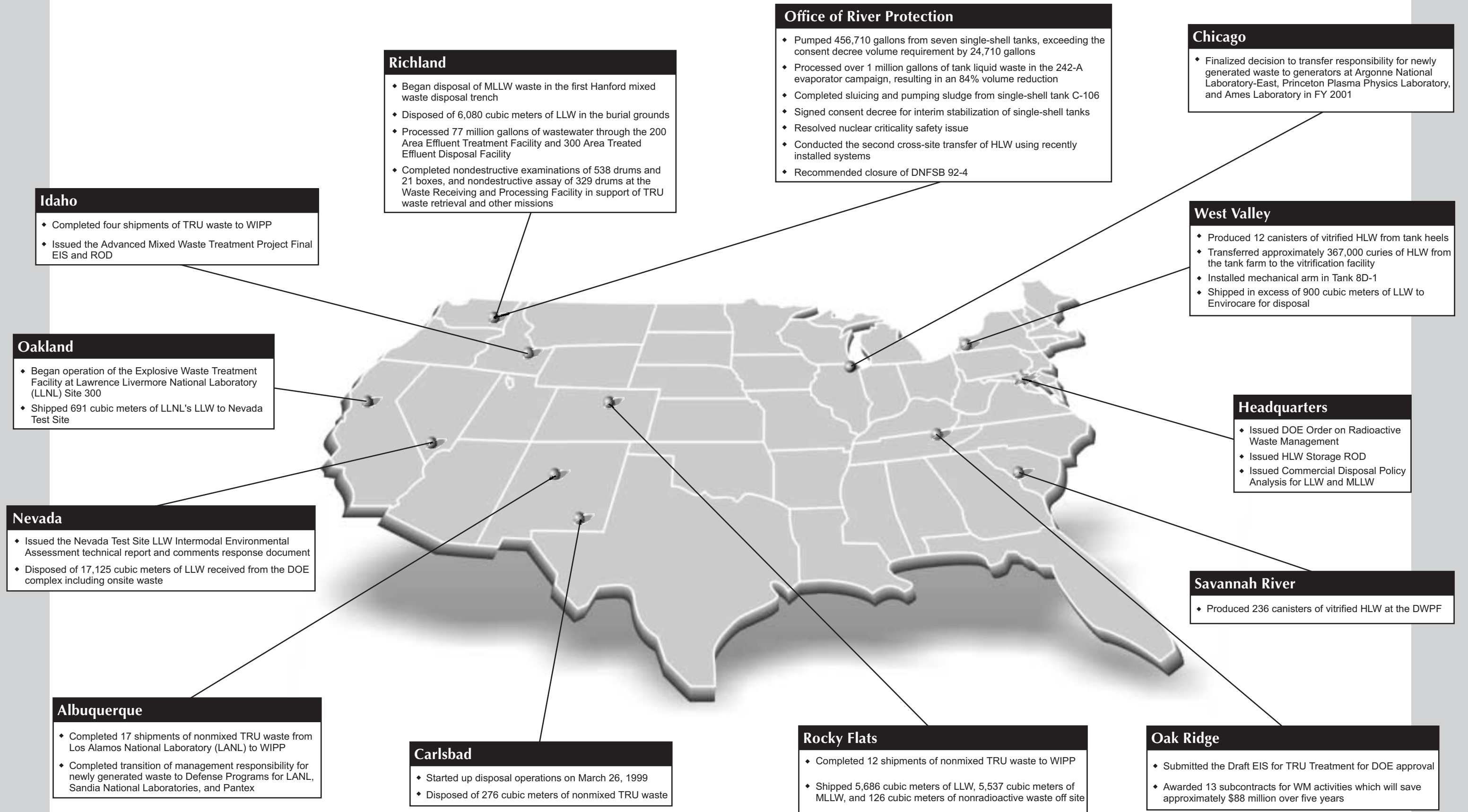
A truck loaded with TRUPACT-IIs ready to depart Rocky Flats on June 15, 1999

Resource Conservation and Recovery Act (RCRA) Part B Permit Impacts

During February 1999, the State of New Mexico held public hearings on the draft RCRA Part B Permit that was released for review in November 1998. As FY 1999 ended, DOE was awaiting the issuance of the final RCRA Part B permit by the New Mexico Environment Department. The final permit will allow WIPP to begin disposing of mixed TRU waste, or TRU waste that contains a hazardous component. The permit, which was issued on October 27, 1999, is highly restrictive and contains several provisions that will present a significant challenge to DOE to keep the pipeline of waste to WIPP filled and the current shipping schedule on track. The final permit places restrictions on the continued use of Panel 1, which is where the waste is currently being disposed, on the sites' characterization programs, and requires the management and operating contractor at WIPP to provide financial assurance for closure of the facility. The permit also prohibits remote-handled TRU waste disposal until the completion of a permit modification.

The RCRA Part B permit prohibits the emplacement of mixed TRU waste in the existing disposal panel because the panel contains nonmixed waste that was not characterized in accordance with the final permit requirements; however, the permit will allow continued emplacement of nonmixed TRU waste in the existing panel after the permit becomes effective. Also, mixed and nonmixed TRU waste must now be characterized according to the new permit requirements before it can be disposed in WIPP. This means that shipments to WIPP will be suspended temporarily while the Department gets the currently audited and approved generator sites approved under a new permit-compliant Waste Analysis Plan and Quality Assurance Program. In addition, a second disposal panel will not be ready to accept mixed waste until July 2000, which may mean even longer delays in starting the mixed TRU waste shipments.

These impending delays will seriously jeopardize the Department's ability to meet compliance and closure milestones at Rocky Flats, Idaho, Oak Ridge, and Mound. The WIPP program is working with the generator sites to meet the new permit requirements. In an attempt to keep the pipeline to WIPP filled, priority will be given to certifying Rocky Flats first, followed by Hanford, INEEL, and the other sites.



MIXED LOW-LEVEL & LOW-LEVEL WASTE PROGRAMS

Record of Decision on Treatment and Disposal of MLLW and LLW

In FY 1999, the Office of Waste Management continued discussions with stakeholders on possible LLW and MLLW treatment and disposal locations, as the Department prepares to announce its site preferences and issue a Record of Decision (ROD). DOE evaluated programmatic LLW and MLLW treatment and disposal alternatives in the *Final Waste Management Programmatic Environmental Impact Statement* (WM PEIS), issued in May 1997. Three other RODs based on the WM PEIS have been issued to date, establishing DOE positions on storage of high-level waste; treatment and storage of transuranic waste; and the disposition path for the treatment of nonwastewater hazardous waste in the waste management complex.

The Final WM PEIS stated the Department's preference to regionally dispose of LLW and MLLW at two or three sites from six candidate sites (Hanford, INEEL, Los Alamos National Laboratory, Nevada Test Site, Oak Ridge Reservation, and SRS), but the WM PEIS did not select preferred sites. DOE is in the process of concluding an extensive series of workshops and meetings with the states, Tribal Nations, regulators, and other stakeholders in which possible disposal options were discussed. These decisions were also part of the Secretary's recent Environmental Roundtable discussions with state governors.

DOE will issue a Notice of Preferred Alternative, notifying the public of its preferred disposal sites, before issuing a final decision. This fulfills a Department commitment in the WM PEIS that, following consultations, DOE would notify the public as to which specific sites it prefers for disposal of LLW and MLLW by publishing a notice in the *Federal Register*. This notice is expected to be released early in FY 2000. The Department will follow the notice with a final ROD for LLW and MLLW treatment and disposal, no earlier than 30 days later.

Issuance of the LLW and MLLW treatment and disposal ROD is expected to allow those DOE sites that do not currently have access to offsite DOE disposal to begin shipping their wastes for disposal. Other DOE generator sites, which currently ship their LLW off site to one of the Department's six disposal facilities, would continue such shipments, though some generator sites may begin shipping their LLW to a different DOE site than they currently use. There are no DOE sites currently authorized to dispose of offsite generated MLLW. Under the ROD, all DOE sites would be able to start shipping their MLLW to offsite DOE disposal.

Commercial Disposal Policy Analysis

DOE's *Commercial Disposal Policy Analysis for Low-Level and Mixed Low-Level Wastes* was issued by DOE in March 1999. Although five different options were evaluated relating to the use of commercial facilities to dispose of LLW and MLLW, the Department decided to maintain its current waste disposal policy and practices. DOE will continue to dispose of LLW and MLLW at the DOE site where it is generated or, if onsite disposal is not practical, at another DOE site. This policy allows DOE sites to obtain an exemption to send LLW and MLLW to commercial disposal facilities when it is in the best interest of the Department and the commercial facility is licensed by the Nuclear Regulatory Commission or an agreement state.

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Fernald Resumes LLW Shipments to Nevada

The Fernald Environmental Management Project in Ohio resumed shipments of LLW to the Nevada Test Site in June 1999.

Savings at Oak Ridge

Outsourcing of fixed priced subcontracts by the management and integration (M&I) contractor Bechtel Jacobs Corporation at Oak Ridge in Tennessee began implementation in the second half of FY 1999. The first phase of these three- to five-year subcontracts with option years covers about 75% of the waste operations for newly generated waste and legacy waste on the Oak Ridge Reservation. The outsourced subcontracts save over 20% from the M&I's self-performance baseline and amount to close to \$90 million in savings over five years. Thus far, this innovative approach is a success for Waste Management, and is a cornerstone for accelerating other cleanup activities at Oak Ridge.



Shipment of low-level waste from Fernald entering the U3ah/at disposal cell at the Nevada Test Site Area 3.

CROSSCUTTING HEADQUARTERS INITIATIVES

DOE Order on Radioactive Waste Management Issued

DOE Order 435.1, *Radioactive Waste Management*, and its associated manual and implementation guide were issued in July 1999. The Department conducted a complex-wide broadcast to announce the release of the directive documents, and the Office of Waste Management conducted a stand-down training of headquarters personnel. The revised DOE Order 435.1 ensures that all DOE radioactive waste is managed in a manner that protects the public, workers, and the environment from exposure to radiation. In addition, radioactive waste management will comply with applicable Federal, state, and local laws and regulations. The manual further describes the requirements and establishes specific responsibilities for implementing the Order to manage DOE high-level waste, transuranic waste, low-level waste, and the radioactive component of mixed waste. The implementation guide describes the acceptable approaches to meeting the performance-based requirements and describes the technical basis and rationale for those requirements. DOE Order 435.1 is to be implemented immediately and sites are to be in compliance within one year of the effective date of the Order by either implementing the requirements or having an approved implementation or corrective action plan.

Complex-wide Integration

The Office of Environmental Management's (EM) complex-wide integration initiative continued to make progress during FY 1999 in identifying, evaluating, and implementing integration opportunities that could result in substantial cost savings, schedule accelerations, technology improvements, and risk reduction. Through inter-site collaboration and workshops held in FY 1999, the 12 program area integration teams brought to the EM Integration Executive Committee over 40 recommendations (for either approval to implement or proceed with detailed evaluation) for complex-wide improvements. Opportunities that were approved have the potential for life cycle cost savings and will help accelerate closure schedules for several sites. One cost-saving opportunity approved for implementation is the consolidation of TRU waste from sites with small inventories to sites with greater inventories. Many DOE sites have small quantities of TRU waste that require special treatment. Under this opportunity, some sites would ship their TRU waste to larger sites, thereby saving the cost of developing capabilities to treat, package, and certify the wastes at each site, as well as facilitating closure milestones of those sites. Discussions have begun on the actual waste movements.

Improvements also were made in efforts to develop disposition paths for all waste and materials streams, using the baseline disposition maps initially developed in FY 1998. The Analysis and Visualization System improved complex-wide data collection and sites continued to work together to identify disposition paths, streams where disposition paths are not yet available, and barriers that can impede achievement of a disposition path. To date, baseline disposition paths have been established for over 2,700 waste and material streams; however, over 700 of those streams have barriers that impede ultimate disposition. By characterizing and better understanding the barriers, the EM program is in a better position to prioritize where it allocates funding for programs (including science and technology) and where complex-wide integration efforts are needed.

EM Integration Site Capabilities Web Site

The EM Integration team maintained a web site on the EM home page during FY 1999 that provides information on the status of integration opportunities being evaluated. An exciting new aspect soon to be released is the EM Integration Site Capabilities Web Site. This web site will provide a marketplace where EM staff and contractors can find solutions to their own problems or offer help to others. The web site will feature web pages with specific capabilities offered by each field office, such as disposal of LLW or the broad spectrum contract for waste treatment. These web pages will provide contact information and

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links to field office web pages with more detail. Another feature being developed is a marketplace bulletin board, where problems and needs can be posted and solutions offered. The Site Capabilities Web Site is planned to be available in early FY 2000.

Re-engineering in FY 1999

The objective of re-engineering waste management is to return financial responsibility for newly generated waste to the generating organization. In FY 1999, EM continued the process of transferring responsibility for newly generated waste at the following six sites: four sites under the Chicago Operations Office, the Argonne National Laboratory-East, Ames Laboratory, the Princeton Plasma Physics Laboratory, and the Brookhaven National Laboratory; the Lawrence Berkeley National Laboratory under the Oakland Operations Office; and the Pacific Northwest National Laboratory under the Richland Operations Office. Responsibility will be transferred to the Office of Science, effective with the FY 2001 budget. Planning for transfer of financial responsibility for newly generated waste at the Lawrence Livermore National Laboratory and the Oak Ridge Operations Office continues and may be affected by DOE reorganization efforts associated with establishing the National Nuclear Security Administration.

Technology Development

The Office of Waste Management continued its partnership with the Office of Science and Technology and completed onsite and televideo training for the Technology Management System (TMS) for waste management users. TMS is the on-line integrated data system that provides user access to technology development and deployment projects. The Carlsbad Area Office was the first waste management user to populate the TMS system following the training. Other field offices are also participating in the TMS population effort.

New technologies continue to be implemented at waste management projects throughout the complex, with the expected benefits of lowering risks, reducing costs, and accelerating schedules. One of the technologies deployed this year is the AEA Fluidic Sampler at Savannah River, which is used to sample radioactive waste safely from underground tanks. This technology provides a safer mode of operation, reduces sampler maintenance, and allows a more representative sample to be collected during pumping so that less sampling and analyses are required. The New Waste Calcining Facility (NWCF) Offgas Sampling System deployed at Idaho successfully achieved the first-ever NWCF offgas physical measurements. This improved U.S. Environmental Protection Agency sampling method was needed to comply with air permit requirements for the facility. The Density Monitor for Tank Waste Slurry deployed at Oak Ridge measures the mass flow, density, and temperature of fluids or slurries simultaneously. Once mass flow and density are determined, other functions can be calculated, such as volumetric flow and suspended solids concentration.



The New Waste Calcining Facility at the Idaho National Engineering and Environmental Laboratory.

WASTE MANAGEMENT—A DECADE OF PROGRESS

DOE established the Office of Environmental Restoration and Waste Management, changed to the Office of Environmental Management (EM), in 1990 as the Cold War was coming to an end and the nation was changing its focus away from production of nuclear weapons toward cleaning up the legacy of waste that was left behind. Within EM, responsibility for managing all present and future waste at operating DOE sites was consolidated under the Waste Management Program. For ten years, Waste Management has been carrying out its mission to safely and efficiently store, treat, and dispose of DOE waste in a manner that protects human health and preserves the quality of our environment. This time line highlights some of Waste Management’s major accomplishments of the past decade.

The Office of Waste Management (OWM) is established, consolidating responsibility for managing DOE's waste under one organization

Program assessments are performed across the DOE complex to further clarify and identify waste management issues

The initial EM Five-Year Plan is issued, laying out a plan for cleaning up DOE's nuclear-related waste sites and bringing its facilities into compliance with environmental laws and regulations

The Toxic Substances Control Act incinerator at Oak Ridge in Tennessee begins operations

Energy Secretary declares WIPP ready to receive waste for test phase

The Tank Waste Remediation System is established to provide an integrated approach to managing HLW at Hanford

DOE cancels the WIPP test phase and refocuses on disposal phase readiness

The Waste Experimental Reduction Facility in Idaho for treatment of LLW is upgraded

Hanford installs a new pumping device in a HLW tank, virtually eliminating the potential for explosion

OWM issues the first Annual Report on Waste Generation and Waste Minimization Progress

Rocky Flats begins shipments of LLW to the NTS for disposal

Operations begin at the Effluent Treatment Facility at Hanford

LANL begins retrieval of bermed TRU waste

Savannah River restarts the evaporator system, processing and reducing over 1 million gallons of HLW

25 site treatment plans are completed for the treatment of mixed waste as required under the Federal Facility Compliance Act

WVDP and DWPF, the nation's first facilities for vitrifying radioactive HLW, begin operations

The new High-Level Liquid Waste Evaporator starts operation at INEEL

Hanford site completes construction of the Waste Receiving and Processing (WRAP) Facility

DOE issues the Final Waste Management Programmatic Environmental Impact Statement

The first HLW storage tank is closed at Savannah River

Operations begin at the Hanford WRAP Facility

The Consolidated Incinerator Facility at Savannah River begins operations to treat MLLW and LLW

OWM begins EM Integration initiative across the EM complex

Calcining of nonsodium bearing liquid high-level waste at INEEL is completed four months ahead of the Idaho Settlement Agreement milestone

The primary vitrification campaign at West Valley is completed, ahead of schedule and under budget

Savannah River closes the second HLW storage tank

WIPP SEIS ROD for disposal of transuranic waste is issued

WM PEIS RODs on transuranic waste treatment and storage and on treatment of nonwastewater hazardous waste are issued

The first budget transfer to DOE waste generators is made under the waste management re-engineering initiative

DOE receives EPA certification that WIPP meets Federal regulations for the disposal of TRU waste

DOE signs privatization contract for treatment and immobilization of Hanford site's HLW

WIPP begins disposal operations, opening the pipeline for disposal of transuranic waste currently stored across the country

DOE Radioactive Waste Management Order and guidance are issued

OWM completes 18 years of technical support to states for development of new capacity for disposal of commercial LLW

WM PEIS ROD on HLW storage is issued

DWPF produces 236 canisters of vitrified HLW, bringing the total canister inventory to 719; WVDP adds 12 canisters, making their total inventory 241



WASTE MANAGEMENT IN FY 2000 AND BEYOND

Under the new EM organization, responsibility for the waste management initiatives described in this report will be transferred to newly formed organizations at DOE headquarters. Waste management at Idaho, Savannah River, Richland, and the Office of River Protection at Hanford will fall within the Office of Project Completion. Ohio, Oak Ridge, Rocky Flats, Nevada, Albuquerque, Chicago, and Oakland activities will be under the Office of Site Closure. The Office of Integration and Disposition will manage waste type crosscutting issues, waste management policy, re-engineering, and EM Integration activities, as well as have headquarters responsibility for the WIPP program and pipeline issues.

Listed below are some of the major waste management goals and priorities that are planned for FY 2000 and beyond.

- ◆ West Valley plans to complete vitrification of waste remaining in the high-level waste tanks by FY 2001, producing an estimated 5 canisters per year in FY 2000 and FY 2001. A future ROD will establish requirements for project completion for 12 waste management areas, including closure of the underground high-level waste tanks.
- ◆ Savannah River expects to continue HLW vitrification, producing about 200 canisters annually in FY 2000 and FY 2001.
- ◆ Idaho's Settlement Agreement commits DOE to remove 3,100 cubic meters of TRU waste by December 31, 2002, and a running average of 2,000 cubic meters per year after that to meet the milestone to remove 65,000 cubic meters from Idaho by 2018. Toward that commitment, INEEL expects to ship about 1,000 cubic meters of TRU waste to WIPP in FY 2000.
- ◆ To meet the Rocky Flats accelerated closure commitment by FY 2006, Rocky Flats plans to ship up to 1,000 cubic meters of TRU waste off site to WIPP in FY 2000, assuming Rocky Flats can resume shipping by January 2000 under the RCRA Part B program. Rocky Flats also is targeting to ship over 6,500 cubic meters of LLW and MLLW off site in FY 2000. (Final shipping quantities and associated milestones are still under negotiations with the contractor.)
- ◆ Oakland Operations Office plans to complete cleanup of the General Atomics site in FY 2000, with the offsite removal of all legacy waste.
- ◆ Richland plans to receive final certification and begin shipments of TRU waste to WIPP in FY 2000.
- ◆ FY 2000 milestones for the Office of River Protection include:
 - initiate interim stabilization of four additional single-shell tanks (SST)
 - reduce total organic complexant pumpable liquids to 38% of the total volume of the SST
 - issue an authorization to proceed with design, construction, and operation on the Hanford site HLW privatization project.
- ◆ Oak Ridge Operations Office plans to issue the environmental impact statement for the TRU waste treatment privatization project and initiate the construction phase of the project.

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